

A Corporate Publication of Santee Cooper

# POWERSOURCE

SPRING 2009

JEFFERIES HYDRO PLANT



# from the CEO

America has a new presidential administration in Washington and an economic downturn unlike any we have ever experienced in our professional lives. We are attempting to restart a dormant nuclear power industry as well. Throw all of these ingredients together, and you have a recipe for challenging times. Santee Cooper is rising to the occasion, putting our nose to the grindstone and working to solve dilemmas confronting our mandate to provide reliable, affordable electricity that is protective of the environment. There are many issues in front of us, from looming new carbon taxes to stalled nuclear regulations.

Meanwhile, the new administration is pushing forward on mandates that utilities generate a certain percent of their electricity from renewable sources. There is nothing firm yet, but it looks like much of Santee Cooper's renewable generation - hydroelectricity and some of our older landfill gas generating units - could be excluded from the list of acceptable renewable generation. That means that even though Santee Cooper is leading the way in South Carolina, and really is one of the most progressive utilities seeking to produce renewable electricity in the Southeast, we will still fall short of the likely renewable energy standard adopted in Washington. It will be expensive for our customers, but not nearly as expensive as some of the proposals for carbon taxes or cap-and-trade systems.

Santee Cooper will comply fully with all regulatory requirements at the state and federal levels, as we always have. South Carolina has been hit hard by the

current recession, and many of our customers cannot afford significant increases in their electric bills today. The unfortunate reality is that if these scenarios for renewable standards and carbon legislation come to pass, our customers - not just residential, but also jobs-providing commercial and industrial customers - will suffer. And if our commercial and industrial customers suffer, they cut jobs or shut down, and we all suffer.

Look for a Q&A session with me later in this issue of PowerSource, in which I more fully address some of these vital energy issues. Please read it, and please let PowerSource know your thoughts on these matters. Santee Cooper is working diligently to create awareness on these pressing topics, and to educate those writing new laws on the impact they will have on our customers and the state. We certainly appreciate your support.



**Lonnie N. Carter**  
President and Chief Executive Officer



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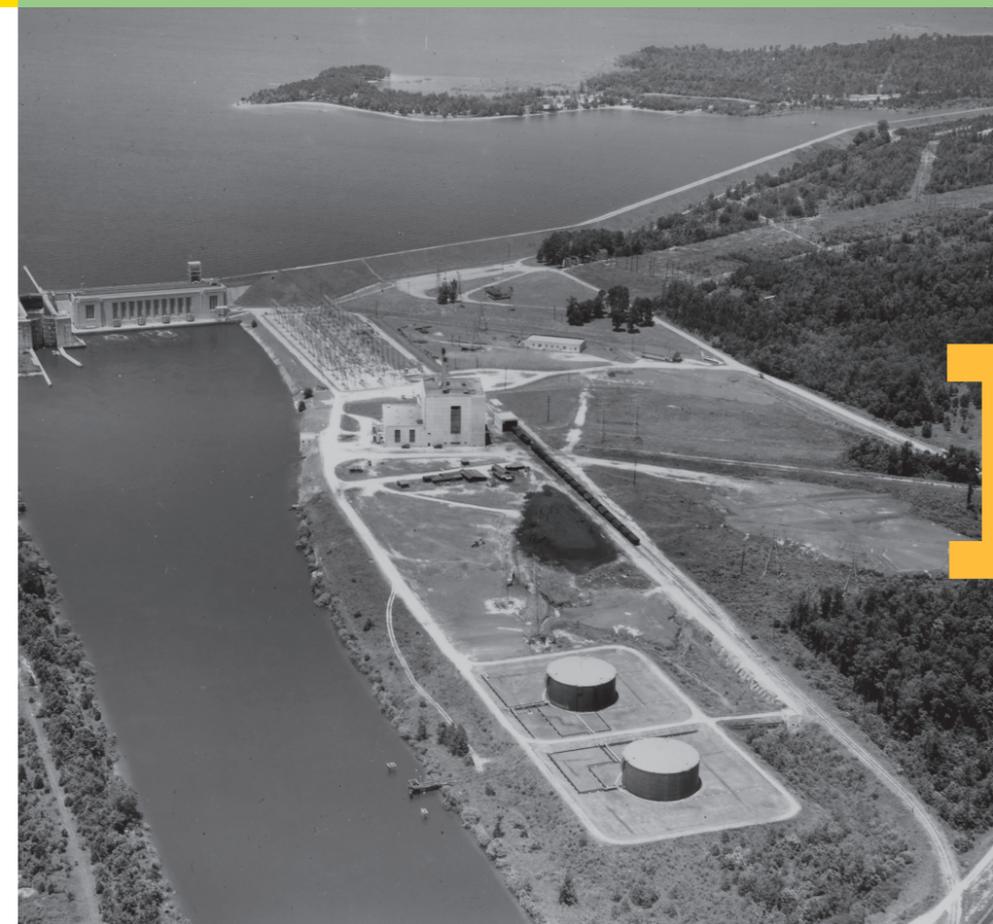
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# Wind Research HEADS TO HIGH seas

By Mollie Gore

Photos by Jim Huff

**“Santee Cooper...back tilting at windmills”**

**“Wind energy off S.C. coast - just a bunch of hot air?”**

**“The (energy) answer my friend... may be blowing in the wind.”**

These are just a sample of headlines following Santee Cooper’s March 9 announcement, with Coastal Carolina University and the South Carolina Energy Office, that they are launching weather buoys into the ocean to test the water for a potential 80-megawatt wind farm. Among other things, the announcement marked a significant step that positions South Carolina as a leader in the rapidly developing national wind energy landscape.

Six buoys and two land-based stations will measure wind speed, direction and frequency at stations up to 6 miles out into the Atlantic Ocean. One string of buoys begins at Georgetown, near an ongoing wind study at Winyah Bay; the second string begins at Waties Island, by Little River and near another ongoing wind study.

The buoy deployment will be followed by Santee Cooper’s installation of an offshore platform in about six months, near one of the buoy paths. Coastal Carolina researchers, working closely with counterparts at North Carolina State University, will evaluate the buoy data to help pinpoint the best location for the platform, which will measure upper-level winds more similar to those a wind turbine would encounter. The offshore wind platform is expected to gather data for at least a year.

“Santee Cooper believes that all reasonable renewable energy initiatives must be explored, and wind energy is a promising opportunity for South Carolina,” said Lonnie Carter, Santee Cooper president and chief executive officer. “As a public power company, Santee Cooper is committed to providing South Carolinians with affordable, reliable energy that is protective of our environment. We have been testing wind viability onshore for several years, and the experience has encouraged us to take this next important step.”

“No power company in America is generating offshore wind energy, and very few are exploring its viability,” Carter continued. “With this buoy deployment and the offshore station to come, South Carolina is establishing its spot along the

**Students participating in Santee Cooper’s Wind-For-Schools program at Georgetown High School view one of the weather buoys at the March 9 press conference.**



front of the offshore wind pack. That can be good and bad. When you’re leading the way, you don’t always know what lies around the bend.”

Marc Tye, Santee Cooper’s vice president of conservation and renewable energy, noted that the project falls squarely in line with Santee Cooper’s goal to provide 40 percent of its energy by 2020 through non-greenhouse gas emitting resources, biomass fuels, conservation and energy efficiency.

Coastal Carolina will lead the analysis of the buoy data.

“Thanks to the expertise of our faculty, Coastal Carolina University has long been involved in many partnerships with public and private organizations on projects that

positively influence the lives of people locally, regionally, around the state and internationally,” said Dr. David A. DeCenzo, president of Coastal Carolina University. “Under Paul Gayes’ direction, the University’s Burroughs & Chapin Center for Marine and Wetland Studies will play a significant role in this historic venture. We are excited about this project and about the fact that our students will have a part in exploring the possibilities of developing wind energy as a viable source of renewable energy for South Carolina.”

Part of the buoy study is funded through a U.S. Department of Energy grant secured by the South Carolina Energy Office.

**Dr. Paul Gayes, Coastal Carolina University’s lead researcher on the project, explains how the buoys will work.**

“Development of renewable energy is not only important for South Carolina’s environment - it is a key component of economic development for our state,” said John Clark, the South Carolina Energy Office’s director. “South Carolina has very few traditional energy resources - it has no coal, no oil, no natural gas and no uranium. Therefore, we end up sending jobs and money out of state with every fuel purchase. In fact, we spend about \$20 billion every year on energy... A new offshore wind economy could create many jobs by employing environmental engineers, iron and steel workers, millwrights, sheet metal workers, machinists, electrical equipment assemblers, construction equipment operators, industrial truck drivers, and industrial production managers.”

The DOE grant covers about 45 percent of the project’s \$430,000 cost, and Santee Cooper is paying the balance. Santee Cooper will pay for the platform.

The buoys are provided by N.C. State. The offshore project is the latest in a series of wind research initiatives involving several organizations in South Carolina. In addition to the partners in this offshore project, stakeholders include Clemson University’s Restoration Institute, Clemson’s Institute for Energy Studies, the Savannah River National Laboratory, the University of South Carolina’s Baruch Research Institute, and EcoEnergy LLC.

**South Carolina Energy Office Director John Clark, left, CCU President David DeCenzo and Santee Cooper President and CEO Lonnie Carter all spoke at the March 9 announcement in Georgetown.**

“These buoys will help document whether offshore wind here is strong enough to generate electricity,” Carter said. “Commercial wind turbines need about eight miles-per-hour winds to begin turning and are rated for



wind speeds of 31 miles an hour. We’re about to find out if Palmetto Winds can do the job.”

Because offshore wind generation is new to the U.S., there are many challenges still to resolve. The two projects announced March 9 will gather data for at least the next 18 months. Meanwhile, a group of state stakeholders will begin considering how to permit offshore wind turbines, and a separate group will be considering transmission needs. Federal permitting regulations are also under development.

“If Santee Cooper learned tomorrow that we could generate 1,000 megawatts off our coast, we still could not build the first offshore turbine because there are no federal or state regulations in place telling us how to permit and build them,” Carter said.

“Another consideration is cost,” added Tye. “Wind energy is not free. The machinery to harness wind is expensive to build and to maintain in the rough ocean condition. Plus, we have to bring the electricity from the turbines several miles offshore to our transmission and distribution systems here on the coast. The cost of wind-generated electricity will be at least twice as expensive as traditional generation.”

The goal at the end of the study, if the data supports it, is to construct an 80-megawatt wind farm to help supplement power needs to customers. “Santee Cooper thinks wind could be an important tool in our strategy to diversify our generation and strengthen our leadership position in renewable energy in this state,” Carter said. “We know this won’t be easy, and we know there will be opposition to offshore wind farms. We will seek out public input in this. But we wouldn’t be taking this step if we weren’t committed to seeing the project to a logical, practical conclusion.” PS

**In August, Santee Cooper crews installed a 150-foot wind tower at the Baruch Research Institute at Winyah Bay in Georgetown. The tower’s data has since confirmed that winds on land will not generate commercial-scale power.**



# Santee Cooper Generation

# A Parade of



# POWER

*April 7 marked the 75th anniversary of the enabling act that created the South Carolina Public Service Authority - more commonly known as Santee Cooper. PowerSource is observing this anniversary in each quarterly issue through 2009.*

*This issue focuses on the generating stations in Santee Cooper's portfolio. The summer magazine will examine the impact of Hurricane Hugo on*

*the state's largest power producer. In the fall, PowerSource will reflect on how Santee Cooper lives up to its mandate of improving the quality of life for all the people of South Carolina.*

Now, a pass through to Santee Cooper's generating station parade, in order of commercial operating year...

by Willard Strong    Photos by Jim Huff and Santee Cooper archives

**Jefferies Hydroelectric Station (1942)**  
*Moncks Corner, Berkeley County*  
**128 Megawatts**

When construction began on the Santee Cooper Hydroelectric and Navigation Project on April 18, 1939, the centerpiece of the massive endeavor was, and in many ways remains, the hydro station. This is where power first flowed, on Feb. 17, 1942, to a defense industry in North Charleston that made ferrochromium, a key



metal used to harden steel for tanks and warships. That began Santee Cooper's long history of its contribution to national defense, continuing today by serving the Charleston Air Force Base. Originally called the Pinopolis Power Plant, Santee Cooper's landmark facility cost \$58.6 million to construct. Jefferies Hydro features distinctive art deco architecture and a unique navigation lock imbedded in the massive structure. It majestically towers above the Tailrace Canal, and its two massive gates easily ignite reminiscences of medieval castles that offered protection from marauding infidels.

This place, this symbol of mankind's rapid advancement in the mid-20th century, is where political will, engineering expertise and American know-how coalesced to bring South Carolinians into the modern electric age.

It happened by harnessing the power of water that flows into Lake

Moultrie from a 15,000-square-mile watershed extending into North Carolina. Imagine a giant funnel with streams, lakes and rivers at the funnel's top and Jefferies Hydro at the bottom. That's basically how the water that turns the turbines gets to the water intakes.

There are five units in the facility, capable of producing 128 megawatts, enough electricity to power about 59,000 average-sized homes in South Carolina.

**Santee Spillway Generating Station (1950)**  
*Pineville, Berkeley County*  
**2 Megawatts**



Unknown to many, there is a 2-MW generating unit behind the Santee Dam that holds back the waters of Lake Marion.

Installed in 1950 at a cost of \$400,000, this one-unit facility runs continuously, utilizing a 515-cubic-feet-per-second water flow from the lake that Santee Cooper is required to discharge from the dam into the Santee River.

While capable of powering only about 900 homes, that energy adds up. In a typical year, the little station that can, does, producing nearly 12 million kilowatt-hours.

**Jefferies Generating Station (1954 and 1970)**  
*Moncks Corner, Berkeley County*  
**398 Megawatts**

This was the second large-scale generating station Santee Cooper built and it sits adjacent to the Jefferies Hydro Station on the east side of the Tailrace Canal.

Units 1 and 2 were completed in 1954 at a cost of \$15.7 million and were designed to utilize either oil or coal as a fuel source. Originally coal-fired, it was later converted to run exclusively on oil. The two units have a combined generating capability of 92 MWs.

As Santee Cooper's need for power grew, two coal-fired units, Units 3 and 4, entered commercial operation in 1970 rated at 306 MWs. Jefferies fossil-fueled generation, 398 MWs, can power about 183,000 homes.



## Myrtle Beach Combustion Turbines (1962, 1972, 1976)

Myrtle Beach, Horry County  
90 Megawatts



When it gets unseasonably warm or cold for brief periods of time, Santee Cooper and many other utilities can call on their standby generation to meet short-term peaks in demand.

Called “peaker units,” they can be started quickly, providing brief bursts of needed power for several hours to several days. At Myrtle Beach, the first of three combustion turbine units began as an oil or natural gas 20-MW generator in 1962. A 40-MW oil-fired generator followed in 1972 with a 30-MW oil unit completing the facility build-out four years later, representing a total \$10.1 million investment. Its 90 MWs can light up nearly 41,500 homes.

## Grainger Generating Station (1966)

Conway, Horry County  
170 Megawatts

The Grainger Generating Station is a unique part of Santee Cooper’s fleet of power plants in that while Santee Cooper has operated and



maintained the facility since its inception, it does not actually own it. Grainger is a testament to Santee Cooper’s continuing level of partnership with the state’s electric cooperatives. Demand for power again necessitated adding new generation. Grainger was constructed and is owned by Columbia-based Central Electric Power Cooperative.

Formed in 1948, Central purchases power wholesale from Santee Cooper and Central then sells that power to its members, the 20 distribution cooperatives statewide. Central was able to take advantage of low-interest federal financing through the Rural Electrification Administration (now the Rural Utilities Service), an arm of the U.S. Department of Agriculture.

Santee Cooper makes payments on the long-term loan and within the next several years, will own outright the two-unit, coal-fired plant. It is named for the late Dolphus M. Grainger, an Horry County native who was instrumental in furthering rural electrification. Constructed for \$29.2 million, it can power approximately 78,000 homes.

## Hilton Head Combustion Turbines (1973, 1974, 1979)

Hilton Head Island, Beaufort County  
97 Megawatts

Hilton Head Island is the second largest barrier island on the East Coast, with the largest being Long Island in New York.



Rapid growth came to this resort development in the 1970s, along with world-class golfing destinations and retirement homes. Electricity is fundamental infrastructure and it became apparent that “peaking power” provided by oil-fired combustion turbines would be needed. The island is served by Palmetto Electric Cooperative, which has Santee Cooper as its main power source through Central Electric Power Cooperative.

The first 20-MW peaker went online in 1973, followed by a companion 20-MW unit a year later and a 57-MW unit in 1979. This \$14.7-million investment is capable of providing power to about 44,600 homes.

## Winyah Generating Station (1975, 1977, 1980, 1981)

Georgetown, Georgetown County  
1,155 Megawatts

The Winyah Generating Station is Santee Cooper’s second largest generating facility today, constructed to meet the burgeoning power demand for the Grand Strand and Pee Dee area of the state.

Units 1, 2 and 3 are rated at 295 MWs each, with Unit 4 weighing in at 270 MWs. Unit 2, which went online in 1977, featured a piece of equipment new to coal-fired generation: the scrubber. A scrubber is an air-emissions device that removes much of the sulfur dioxide from the stack gases. Although not required at the time, Unit 2’s scrubber was the first installed in the Southeast, an early indication of Santee Cooper’s serious commitment to protecting air quality, more than three decades ago.



In 2007, Santee Cooper completed a five-year project to further improve air quality by installing scrubbers on all Winyah units and adding another emissions-fighting component to its arsenal: selective

catalytic reduction. SCRs significantly reduce nitrogen oxide emissions at coal-fired plants.

Reducing emissions is important, and carries immense cost for utilities. For example, when the station build-out was completed 28 years ago, it represented a cost by Santee Cooper and its ratepayers and bondholders of \$364.3 million. The recent scrubber and SCR upgrade costs were \$250 million, an expensive and necessary expenditure for cleaner air, an investment benefitting the 531,300 homes in South Carolina that depend on Winyah for reliable power.

**V.C. Summer Nuclear Station (1983)**  
*Jenkinsville, Fairfield County*  
**318 Megawatts**



Santee Cooper owns one-third of the V.C. Summer Nuclear Station, a joint venture with South Carolina Electric & Gas Co., and Santee Cooper receives one-third of the facility's 973-MW output. When the station was completed at a cost of \$335.4 million, it represented the first joint nuclear project in the Southeast between

publicly owned and investor-owned utilities. But before it was "shovel ready," the arrangement required a change in the state constitution. The statewide referendum easily passed muster by the state's voters and was then ratified by the General Assembly. The arrangement has worked very well, with Summer Station a stellar performer in the nuclear power field.

Santee Cooper's portion of Summer Station's generation can power 146,000 homes. SCE&G and Santee Cooper are seeking state and federal approval to add two more nuclear units at Summer Station at a cost of \$9.8 billion.

**Cross Generating Station**  
**(1983, 1995, 2007, 2008)**  
*Pineville, Berkeley County*  
**2,320 Megawatts**



The Cross Generating Station is Santee Cooper's largest coal-fired generating station and one of the largest in the Southeast—capable of lighting up more than 1 million homes and powering large industries that make aluminum and steel, for example.



In the build-out footprint, the 540-MW Unit 2 was actually constructed first, followed by the 620-MW Unit 1. Unit 3, rated at 580 MWs, was built on time and on budget, as was Unit 2. Unit 1 was constructed for \$171 million less than originally projected, due to favorable interest rates and the competitiveness of the labor and materials market. This saved customers big bucks. Unit 4, a 540-MW unit, entered commercial operation three months early, on Oct. 1, 2008.

All major station construction projects mean jobs and lots of them. For example, for Units 3 and 4, employment peaked at 1,810 workers in March 2006, boosting the Lowcountry economy.

Cross Station represents a \$2.2-billion investment in the Palmetto State's energy future with modernized fossil-fueled generation.

**St. Stephen Powerhouse (1985)**  
*St. Stephen, Berkeley County*  
**84 Megawatts**

While Santee Cooper receives the 84 MWs from this three-unit hydroelectric station, it was constructed by the U.S. Army Corps of Engineers, part of the Cooper River Rediversion Project.



The Rediversion Project was designed to reduce silting in Charleston Harbor. With its operation, water previously discharged through the turbines at the Jefferies Hydro Station is rediverted through the St. Stephen facility and discharged into the Santee River. The \$63.7-million powerhouse is located on the Rediversion Canal, a 14-mile long waterway between Lake Moultrie and the Santee River. In times of drought, Santee Cooper elects not to run St. Stephen for prolonged periods to preserve lake levels. Under optimal conditions, it can power about 38,600 homes.

## John S. Rainey Generating Station (2002, 2004)

Iva, Anderson County  
961 Megawatts

The John S. Rainey Generating Station represented two firsts for Santee Cooper: its first venture into large-scale, natural gas-fired generation and the first station located in the Upstate.



Natural gas is typically much more expensive than coal, and so the Rainey units are used mostly as additional generation in peak seasons. They are especially valued for their quick start-up times. Rainey units also run when it makes sense economically.

The first three units at Rainey Station first hit the grid in 2002, with two combustion turbines rated at 146 MWs each and a 447-MW combined-cycle unit. In 2004, three 74-MW combustion turbine units were added. The \$438.5-million facility is capable of powering 442,000 homes.

## Buzzard Roost Hydroelectric Station (2007)

Chappells, Greenwood County  
8 Megawatts

Santee Cooper operates the Buzzard Roost Hydroelectric Station on Lake Greenwood under a long-term lease agreement initiated in 2006 with its owner, Greenwood County government.

Buzzard Roost and Lake Greenwood were completed in 1940 and prior to Santee Cooper's involvement the county leased the facility to Duke Power Co. until the lease expired. The Federal Energy Regulatory Commission gave the final approval for the new arrangement in 2007. The facility's 8 MWs can power approximately 3,600 homes.

Other generation resources utilized by Santee Cooper includes 327 MWs of firm hydroelectric power provided by the Southeastern Power Administration. Of that amount, 135 MWs are purchased by Santee Cooper and 192 MWs are provided to SEPA customers served by Santee Cooper.



## Green Power Generating Stations (2001, 2005, 2006, 2008) 16 Megawatts

In September 2001, Santee Cooper became the first and remains the only electric utility in South Carolina to generate and offer customers renewable Green Power generation. Santee Cooper's total Green Power generation can power nearly 7,400 homes.

In 2001, the two-unit Horry County Generating Station entered commercial operation at the Horry County landfill. An additional unit was added later. Three reciprocating engines are fueled by methane gas produced from the landfill's decaying garbage at the 3-MW, \$3.44-million facility near Conway. It can power nearly 1,400 homes.

The Lee County Generating Station went online in 2005 at then-Allied Waste's landfill near Bishopville.

The \$8.5 million station has a generating capability of 5 MWs, enough electricity for 2,300 homes.

In 2006, the \$8.5 million Richland County Generating Station became operational with 5 MWs of generating capability at Waste Management's landfill near Elgin.

The Santee Cooper Green Power Solar Site at Coastal Carolina University, with 16 kilowatts of generation, in 2006 became the first facility to place solar power on the state's electric grid. The \$385,000 facility has been annually producing between 20 and 23 megawatt-hours.

Grid-ready renewable power came to the Upstate in 2008 with the 3-MW, \$3.8 million Anderson County Generating Station. It is located near Belton at the Anderson Regional Landfill. **PS**



# The Local Touch

By Jill Watts  
Photos by Jim Huff

At a time when many utility customers don't have a local customer service office in which to conduct business and their telephone call for service is handled from another state or even country, Santee Cooper takes pride in reaching the customer with a local touch.

Zack Dusenbury, vice president of retail operations, says, "Don't we all want a pleasant greeting and someone who can handle your request with respect and efficiency?" Dusenbury, a veteran employee who has spent most of his Santee Cooper experience in the service of customers, says the customer plays a central role in day-to-day operations. He says excellent customer service is a mainstay of the utility's long-term goals.

At Santee Cooper, providing service that exceeds the customers' expectations is central to the very mission of the utility. The enabling legislation that created Santee Cooper in 1934 mandates that the utility will help improve the quality of life for the people of South Carolina.

"We have tremendous respect for our customers, because if not for them we would not be here," says Dusenbury. "That respect permeates all that we do." When a new employee comes to work at Santee Cooper, they quickly understand how important customer service is to the company.

**Karyn Seesan, Santee Cooper customer service representative, greets customers at the utility's new Carolina Forest office.**





**Customer Service Representative Marlinda Livingston provides a friendly greeting at the call center.**

The hard work by employees throughout Santee Cooper pays off in positive marks. Annual research conducted by an independent research company, MarketSearch of Columbia, shows Santee Cooper customers continue to be among the most satisfied in the country when asked what they think of their electric utility. Results from the most recent survey, conducted in the fall of 2008, show Santee Cooper continues to perform better than other utilities in South Carolina and even across the nation. Santee Cooper customers rate their satisfaction with the utility at 99.4 percent, a level significantly higher than the national average of 83.2 percent.

“The high ratings we receive in surveys show the intensity employees feel about getting their jobs done right and going the extra mile to ensure customer satisfaction,” says Dusenbury.

Meeting the customers where they are is central to the customer service philosophy embraced by Ed Bodie, manager of retail services. Bodie manages the customer service functions at the nine local offices the utility maintains across Horry, Georgetown and Berkeley counties as well as Santee Cooper’s call center and Internet customer service. “I’ve always been proud that we meet the customer where

the customer wants to conduct business,” Bodie says. “Over the years, our customers have told us that having someone local is important to them. And I can’t think of a more positive expression of our commitment to them than to be in the communities we serve.”

Customers can meet with a ‘pleasant, friendly representative’ as Dusenbury says, in offices located in Myrtle Beach, North Myrtle Beach, Loris, Conway, Garden City, Pawleys Island, St. Stephen and Moncks Corner.

Earlier this year, the utility added a ninth customer service location in Carolina Forest, the burgeoning residential and commercial development located between Myrtle Beach and Conway.

In a unique partnership with HTC Communications, also known as Horry Telephone Cooperative, Santee Cooper shares space with the local telephone, television, cable and internet provider, at their new facility at Towne Centre on 3990 River Oaks Drive. “It’s a creative solution for both of us at a time

when customer service needs have never been higher and the concern for keeping operations costs down are paramount,” says Bodie.

Edsol Edge is HTC’s customer service supervisor at the new 1,500-square-foot of retail space Carolina Forest location. Edge knows about meeting the customer locally and feels the partnership is a good one. “I think putting Santee Cooper customers in with our (HTC) customers is a good mix. HTC has a strong commitment to customer service, as does Santee Cooper. I think we are natural partners working together to serve our community.” Edge is pleased

when he hears customers make comments such as, “This is nice. I like getting everything here at one place.”

Karyn Seesan, a Santee Cooper customer service representative, is one of the first people to greet customers as they enter the light and airy facility. “Though my name tag shows I am a Santee Cooper employee, I greet every customer. Most are surprised to see Santee Cooper here,” she adds.

**“I’ve always been proud that we meet the customer where the customer wants to conduct business...”**

**Ed Bodie, retail services manager**



**The new Carolina Forest office offers drive-thru service.**

Marc Peterson, Santee Cooper’s customer service supervisor for the new location, is enthusiastic about the new arrangement. “Carolina Forest is going to continue to grow, so we’re glad to make a home here in the neighborhood.” Peterson explains that the new facility helps customers avoid traffic on U.S. Highway 501. And, Peterson adds, customers from both Conway and Myrtle Beach are finding the new site is on their way as they travel to and from work. “The easy-to-access location saves them a lot of time.”



**Ken Sandiford, call center manager, reviews plans for the new call center in Myrtle Beach.**

This new partnership is just another example of Santee Cooper meeting its customers just where they are.

Though local access is a cornerstone of Santee Cooper's brand, the utility maintains the latest technology that customers expect. "We know that our customers all have different needs," says Bodie. "Some want to stop by a local office or call our call center, while others want to do business via the Internet. Customers can view and pay their monthly bill via e-Billing and complete applications online at our website, [www.santeecooper.com](http://www.santeecooper.com). Another option is our Interactive Voice Response system, which allows customers to obtain account information, make payments or report power outages via the telephone. This investment in technology accommodates the needs of all customers, regardless of the way they want to conduct business with the utility."

The use of advanced technology most recently led to an improved design of the monthly bill customers receive. "Customers told us they wanted their bill to include all the details of their electric service and was easy to understand," says Bodie. "Let's face it, no one likes to get a bill but it is a part of doing business. We hope customers will appreciate the new look and the detailed features and graphs." **PS**

# Troubling Times in the Energy Industry



*With Congress discussing carbon taxes and nuclear power expansions, and President Obama calling for increased wind and solar installations, PowerSource sat down with Santee Cooper President and Chief Executive Lonnie Carter to talk about energy issues.*

## Q: What do you see as the most pressing issue facing the energy industry today?

**A:** Well, there are certainly many to choose from. Really, the biggest issue - the overarching issue - is whether utilities can meet our country's growing power needs. The North American Electric Reliability Corporation (NERC) said in 2008 that the nation will dip below acceptable electricity margins in 2015, which means there's a greater chance the power won't be there when you need it. The Southeast is in worse shape - NERC wants margins of 13 percent, and Virginia and the Carolinas are looking at a projected margin of 3.8 percent by 2017. Even worse, that projection anticipates utilities' already planned new generation. It counts Santee Cooper's 600-megawatt Pee Dee Energy Campus in 2014 and our first new nuclear reactor at V.C. Summer Nuclear Station in 2016. We are working towards those commercial launches, but we are still in the permitting process for both, there are many opponents and some significant hurdles, and there are no guarantees.

## Q: What is the status of the Pee Dee Energy Campus?

**A:** The South Carolina Department of Health and Environmental Control awarded the project an air permit in December. That permit was appealed to the DHEC board, which upheld its staff's decision in February. Environmental advocacy groups have appealed that decision to the Administrative Law Court, and we are supporting our application in that venue. Meanwhile, DHEC is considering our application for a water quality permit, and the U.S.

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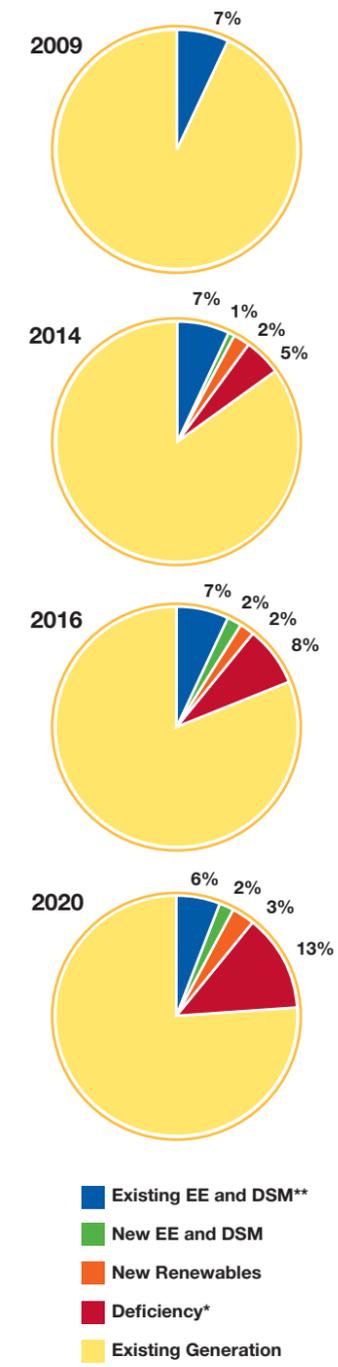
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**SANTEE COOPER CAPACITY REQUIREMENTS**



Army Corps of Engineers is proceeding with its Environmental Impact Statement. The state of South Carolina is growing, and this coal-fired facility, which features the best available environmental control technology, is needed to meet the power needs of new residents and industry. It is a key part of Santee Cooper's mandate to continue providing affordable, reliable electricity that is environmentally responsible.

**Q: Where does new nuclear power fall in our generation planning?**

**A:** Specifically, it falls in 2016 and in 2019 - those are the two years we anticipate bringing new nuclear reactors online at V.C. Summer in Jenkinsville, S.C. We are working with our current nuclear partner, South Carolina Electric & Gas Co., to construct two 1,117-megawatt reactors that will help us prepare to meet an anticipated 1 million new residents to our state by 2025. There are some significant obstacles to this plan, though, especially a federal requirement that Santee Cooper and SCE&G—and all other partner groups—be responsible for each other's debts to obtain federal loan guarantees. The loan guarantees are incentives that will help secure financing for our \$10 billion project.

This current stipulation is a deal breaker. It must be rectified, or our ability to obtain financing will be significantly compromised. There are other issues too, such as a production

\*Projected deficiency will be met with commercial launches of Pee Dee Energy Campus in 2014, the first new nuclear unit in 2016 and the second new nuclear unit in 2019.  
 \*\* DSM is Demand Side Management

tax credit intended to stimulate nuclear power construction but which only applies to investor-owned utilities. Santee Cooper's 45-percent share of the construction cost is not eligible for a tax credit. We are working with friends in Washington to address these major roadblocks and hurdles as quickly as we can. Meanwhile, the project has spending milestones each year, and our 2009 budget includes more than \$300 million for new nuclear power. At some point soon, we have to consider how much more we can prudently spend on a project we aren't sure we can build.

**Q: The cost of energy has certainly been on the rise, and I know Santee Cooper is planning a rate adjustment for late this year. Why?**

**A:** Santee Cooper has not raised its rates in 13 years, and in that time we have brought more than 2,300 megawatts of new generation online. Since 1996, our customer base has increased 60 percent and our sales have doubled. We have cut \$340 million out of this year's budget, and we have restructured debt that has realized \$892 million in gross savings since 1996, which has helped hold off the increase this long. We are at the point where we must raise rates to meet our customers' growing power needs, and we just presented a rate adjustment proposal to our board in April. With their approval, we began a public comment period, and the board could vote on proposed new rates and a rate structure in August with an effective date of Nov. 1. At

the same time, we are introducing more energy efficiency initiatives to help offset the increasing rates and ultimately help customers hold down their bills.

**Q: How will potential carbon legislation and renewable energy standards impact our customers?**

**A:** Carbon legislation has been introduced in Congress before, and the volume of support has certainly increased this year. We don't know what the 2009 version will look like, or what may make it out of Congress, but numbers we have seen call for a \$20 to \$40 per-ton carbon cost. If there are no mitigating allowances that reduce the amount of emissions subject to the charge, costs could jump at least 30 to 50 percent for Santee Cooper customers. There is no practical technology today that will help us reduce carbon emissions at our coal-fired plants. Santee Cooper is diversifying its generating portfolio with additional nuclear power, and we are working to meet 40 percent of our energy needs by 2020 with non-greenhouse gas emitting resources, biomass fuels, conservation and energy efficiency. Even so, a carbon tax, or a cap-and-trade proposal, will penalize not just Santee Cooper but the entire Southeast, which is heavily dependent on carbon-producing generation. This could be a devastating transfer of wealth.

The proposed renewable energy standard, or renewable portfolio standard, is another example of wealth transfer. Some in Washington favor requiring utilities to generate 20 percent of their electricity from renewable resources by 2020. Even with all that Santee Cooper is doing in that area, we would still fall short. South Carolina has limited potential for renewable energy development due to our geography. In particular, we have no real capacity for inland wind farms or commercial-scale solar generation. We are researching offshore wind, but there are no federal or state permitting regulations in place. Nuclear power emits no greenhouse gases, it is the only emissions-free generation capable of base load production in South Carolina, and yet it is not considered renewable energy. We anticipate a 20 percent RPS (or RES) would cost Santee Cooper - and its customers - an average \$28 million a year over the next 10 years. Industrial customers could be especially hit hard by these two potential bills.

These are chaotic times, and the energy industry is far from immune. Santee Cooper has been meeting South Carolinians' needs for 75 years, and we are committed to the future. There are some serious issues to address, but we know where the roadblocks are, and we are working diligently to tear them down. **PS**

WHAT RENEWABLES COST		
Generating Technology	2008 Cost (\$/MWh)	Capacity Factor
Coal	\$ 45-65	90%
CC Gas Turbine	\$ 55-110	75%
Landfill Gas	\$ 59-90	85%
Biomass	\$ 94-135	85%
Offshore Wind	\$ 119-156	35%
Solar PV	\$ 393-529	21%

Source: Renewable Resource Potential, GDS & LaCapra Study



# Schools Let the Sun Shine In



At Aynor Middle School, the halls are bustling with activity. The shrill of the bell signals the beginning of many sixth graders' favorite class of the day. Twenty-one students flood Tom Boling's science classroom, which is modeled like a science lab with high-top tables and built-in sinks. The excited chatter continues as Boling explains the day's plans to the class, which is concluding a lab on heat transfer by radiation.

Today, the students are responsible for collecting cooling data associated with the soil. The key to this lab is for the students to know that solar energy is the driving energy source for heating of the Earth and circulation in the Earth's environment. Since it

By Morgan Bradham  
Photos by Jim Huff (except as noted)

photo by Morgan Bradham

Santee Cooper's Green Power Solar Schools engage students in hands-on learning and activities. Among the 16 Green Power Solar Schools named to date are (left to right) Leslie M. Stover Middle, Hillcrest Middle, Aynor Middle and Ruffin Middle.



is an overcast day, Boling took the time before class to heat the cups of soil under a lamp to simulate the heat from the sun. Boling is a 20-year teaching veteran and former high school teacher; this is his first year teaching sixth graders.

“The kids are never late to class!” said Boling. “They are really excited about the Conservation of Energy labs.”

The Conservation of Energy packet is a tool offered to the state’s Green Power Solar Schools, a program developed by Santee Cooper and the state’s 20 electric cooperatives. The Green Power Solar Schools program began in April 2007 with the dedication of Hilton Head Middle School, and today it involves 16 schools and will include one Green Power Solar School for each electric cooperative territory when fully launched.

The Green Power Solar School costs are funded by customers of Santee Cooper and the state’s electric cooperatives who voluntarily pay extra each month on their utility bills. These customers purchase blocks of Santee Cooper Green Power, at \$3 a block. All revenues from Santee Cooper Green Power sales support the schools’ solar installations and certain other Santee Cooper renewable energy initiatives - just one way Santee Cooper fulfills its mission to be the state’s leading resource for improving the lives of all South Carolinians.

“Coastal Electric Cooperative is excited about this innovative program that we are able to bring to our community,” said Lawrence J. Hinz, Coastal Electric Cooperative’s chief executive officer, at the dedication of Ruffin Middle School’s solar site earlier this year. “Enriching the lives of our young people is



**Two-kilowatt solar panel systems like this are installed at each Green Power Solar School.**

an important part of our cooperative tradition. This solar school program will help educate us all on the environmental improvements that we should consider, so that our quality of life continues.”

Each school designation involves the partnership of Santee Cooper and a local electric cooperative and is designed to encourage interest in the environment and demonstrate the feasibility and limitations of renewable power generation. Santee Cooper installs a 2-kilowatt solar power system at each of the Solar Schools, which provides a teaching, research and hands-on demonstration opportunity for the sixth grade students there. The schools are provided an Internet-based monitoring system that provides real-time access to information regarding the system’s performance from any Internet-enabled computer.

“Exploring renewable energy and conservation topics are important ways to help meet the growing electricity needs in our state, and connect the real world to the classroom,” said Marc Tye, vice president of conservation and renewable energy at Santee Cooper. “Green Power Solar Schools are an important part of our commitment as we continue our Santee Cooper tradition of environmental leadership. We know that working with students and challenging them to think differently about energy sources will reap benefits for future generations.”

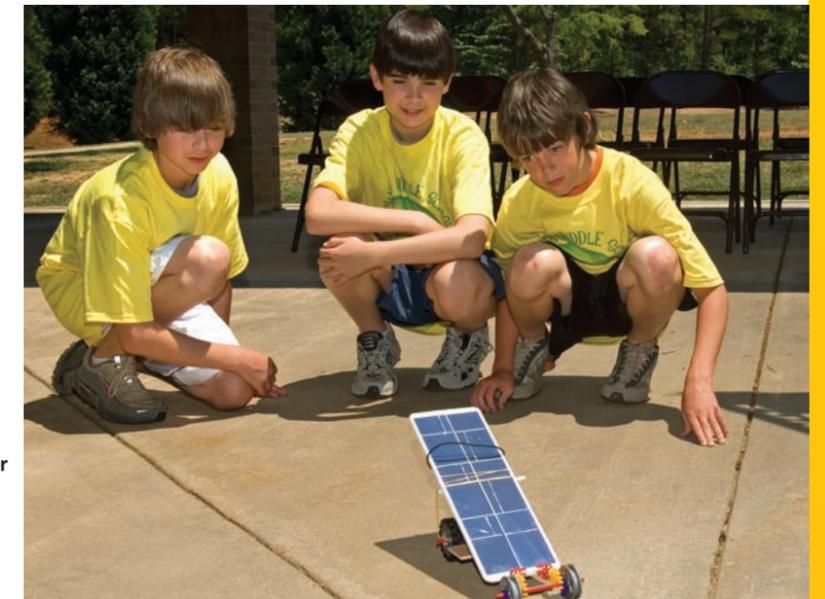
**Students from Chapin Middle School test their solar car, which they built from the Conservation of Energy kit included in their Green Power Solar School materials.**



In addition to the solar panels, the schools also receive a specially designed renewable energy curriculum, dubbed “Conservation of Energy,” endorsed by the South Carolina Department of Education. The curriculum complies with all of the sixth-grade science standards, and was written by Jerry Martin, science consultant, Martha Fout, science learning specialist at the Horry County School District and Dr. Jeff Lee, associate dean at the School of Education at Francis Marion University. Also included in the curriculum is a kit, fully stocked with the materials needed for the lab activities, including materials for a solar car. Each sixth-grade class receives the curriculum as well as the kit.

“The Conservation of Energy packet is very kid-friendly, and much more readable than other science textbooks designed for this age group,” said Boling.

Wendy Nobles, an Aynor Middle School teacher who has taught science for 14 years, is also a fan of the new renewable energy curriculum.



“In all the years that I have taught science, it is hardly ever a favorite among students,” said Nobles. “This year, however, I have seen a big change. The labs are designed to give the students more independence and ownership of their work. They feel like independent little scientists.”

“I see a huge difference in the amount of information the kids are retaining, as compared to last year,” said Nobles. “The concepts are broken down, and not as abstract as those presented in the textbook. Not only are the kids more enthused about science, but I am too!”

Mattie Hucks, Kaitlyn O’Neill, Emily Weekly and Mariah Knuckles-Johnson, students in Noble’s class, discussed their favorite parts of the Conservation of Energy Kit in an e-mail interview.

“Our favorite lab was the convection by water lab because it is a good example of what really happens,” the students agreed. “The ice cube race gave us each a chance to participate and try our ideas.”

Raymond Tuten, a sixth-grade science teacher at Sangaree Middle, another Green Power Solar School, says the learning process with the kit can be best described by the following proverb: Give a man a fish and you feed him for a day; teach a man to fish and you feed him for a lifetime.



“The kit has greatly improved the way the students learn, and it incorporates the best way to teach science—giving the kids something that they can feel, smell, touch, see and hear,” said Tuten.

Sixth-grade students aren’t the only ones getting their hands into renewable energy lessons. Science teachers from Green Power Solar Schools are also given the chance to be students again, at the Solar Schools kit training offered during the summer. The 2008 group was led by Barbara Allen, Santee Cooper director of educational programs,



**A student guitar ensemble helped Ruffin Middle School dedicate its Green Power Solar School panel. Among their musical selection was “Twinkle, Twinkle, Little Star”.**

and the writers of the Conservation of Energy curriculum - Martin, Fout and Lee. The teachers and members of their local electric cooperatives were able to experience the curriculum firsthand, doing the labs themselves.

“Hands-on training is essential in order for teachers to successfully and effectively engage students as they learn about renewable energy,” said Allen. “By participating in the kit-based training, teachers are able to maximize the benefit of being a Green Power Solar School.”

Ruffin Middle School was inducted into the Green Power Solar Schools Program in January, and to mark the occasion, students performed a song written in honor of the event.

Then the superintendent took the stage and delivered the bottom line.

“We are fortunate to be able to expose our young people to the latest technology which is critical as we prepare them for the future,” said Charles W. Gale, Jr., superintendent of Colleton County School District. “This project uses the latest technology and provides our educators with a relevant and exciting science curriculum that will engage students as they explore the energy challenges that we face today.” **PS**

**Marc Tye, Santee Cooper vice president of conservation and renewable energy, opens the solar panel dedication at Leslie M. Stover Middle School.**



### Center for Hydrogen Research Announces New Venture

Santee Cooper and the Center for Hydrogen Research have announced a project that significantly advances hydrogen generation from renewable energy sources. Santee Cooper is providing \$230,000 to the Center for the purchase of a photovoltaic array (PV) to help research applications of hydrogen as a storage solution for solar energy.

The PV array is to be installed this spring at the Center's planned Education, Training and Development Laboratory at Aiken County's Savannah River Research Campus. Part of Santee Cooper's contribution will also be used for on-site and Internet-based education and research opportunities for students and the public. Funding is provided through Santee Cooper's Green Power program, which the state's 20 electric cooperatives support and promote.

One obstacle to the use of solar energy is difficulty storing the energy so that it can be utilized when the sun isn't shining. Hydrogen can be stored and transported, and so is a recognized energy storage solution that has applications for powering vehicles or electrical generation. The PV array would convert sunlight into electricity, which would then produce hydrogen through electrolyzing water. Hydrogen could be converted back to electricity using fuel cells, and it could power hydrogen-fueled vehicles.

### \$2.63 billion 2009 budget

The Santee Cooper Board of Directors approved a \$2.63 billion budget for 2009 at its December 2008 meeting. The board

also approved the 2010 and 2011 budgets for planning purposes.

The 2009 budget includes \$2.03 billion for the electric system, \$6.4 million for the water systems and \$588.9 million for capital expenditures.

More than half of the \$2.03 billion operating and maintenance budget is allocated for fuel and purchased power. The fuel necessary to generate electricity and supplemental purchase power totals \$1.2 billion, with the remaining dollars allocated to all other operating and maintenance costs necessary to operate the utility.

### Board Approves Energy Efficiency & Demand Response Plan

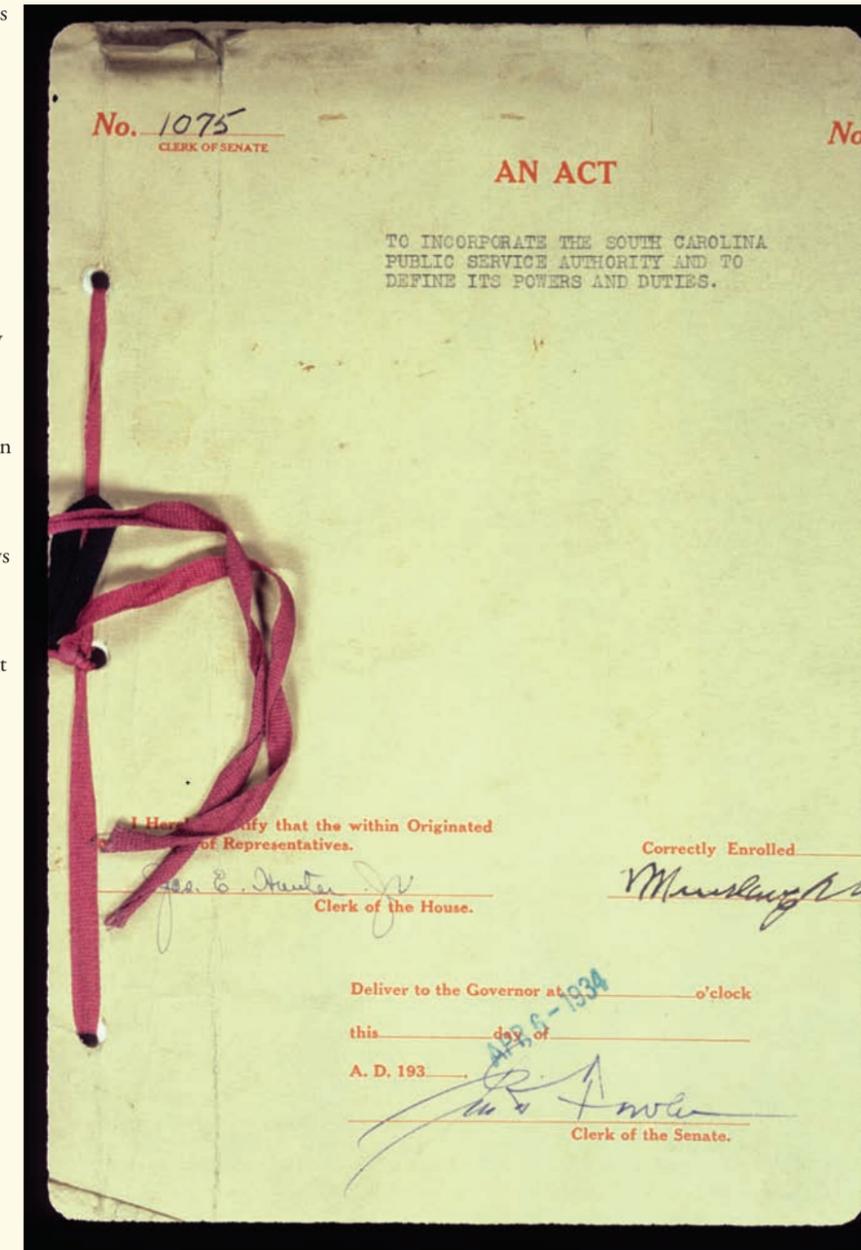
Marking a significant milestone in Santee Cooper's plan to generate 40 percent of its energy by 2020 through non-greenhouse gas emitting resources, biomass fuels, conservation and energy efficiency, the utility's Board of Directors in February approved a series of programs designed to exceed the conservation and energy efficiency segment of that goal for residential and commercial customers.

Specifically, the Board approved Santee Cooper's plans to: renew its successful campaign promoting energy-efficient compact fluorescent light bulbs by expanding promotions to commercial customers and continuing offers for residential accounts; encourage residential and commercial customers to replace older, inefficient refrigerators by offering rebates for Energy Star-rated models; and help residential customers

improve the energy efficiency of their existing homes or construct new energy-efficient ones.

The Board approved spending more than \$113 million through 2020 on these initiatives, which are designed to achieve energy savings that exceed the goal for residential and commercial customers contained in the 40 percent goal. If customer participation meets expectations, the initiatives will save more than 208 million kilowatt-hours annually when the programs are fully launched.

In a separate action, the Board approved a \$2 million increase to Santee Cooper's Low-Interest Loan Program, expanding it from current limits of \$3.5 million on loans to \$5.5 million. This increase allows Santee Cooper to continue the popular program, which offers customers an affordable way to pay for improvements such as installing energy efficient heat pumps, adding an optimum amount of insulation, and installing energy efficiency windows. **PS**



santee cooper



POWERING  
GENERATIONS